**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in this application.

**CLAIMS:**

1.(Currently Amended) A radiation sensor comprising:

a substrate defining a cavity;

an antenna coupled to the substrate;

a thermal detector unit spaced from the antenna and from the substrate;

a plurality of multi-layered conductive leads in contact with the antenna and the thermal detector unit, wherein each of the conductive leads comprises a superconductive layer in electrical contact with the thermal detector unit and the antenna, ~~and~~ a support layer between the superconductive layer and the substrate, and a buffer layer disposed between the support layer and the superconductive layer, each of said support layers cooperating to suspend the thermal detector unit over the cavity.

2.(Canceled)

3.(Currently Amended) The radiation sensor of ~~claim 2~~claim 1 wherein the buffer layer is characterized by a thermal conductivity $K<0.1$ W/cm-K.

4.(Currently Amended) The radiation sensor of ~~claim 2~~claim 1 wherein the buffer layer comprises Yttria stabilized Zirconia.

5.(Currently Amended) The radiation sensor of ~~claim 2~~claim 1 wherein the buffer layer defines a thermal conductivity that is less than one order of magnitude greater than a thermal conductivity defined by the superconductive layer.

6.(Original) The radiation sensor of claim 5 wherein the buffer layer defines a thermal conductivity that is less than a thermal conductivity defined by the superconductive layer.

7.(Original) The radiation sensor of claim 1 wherein the superconductive layer is selected from the group consisting of perovskite superconductors.

8.(Currently Amended) In a radiation sensor for measuring incident radiation comprising a substrate defining a cavity, a thermal detector unit disposed above the cavity, an antenna coupled to the substrate, and a plurality of conductors in contact with the antenna and the thermal detector unit, the improvement comprising:

each of the plurality of ~~the~~ conductors defining a plurality of layers and comprising:

a superconductive layer;

a support layer between the superconductive layer and the substrate; and

a buffer layer between the support layer and the superconductive layer;

wherein each of said support layers cooperate to suspend the thermal detector unit over the cavity.

9.(Currently Amended) In a radiation sensor for measuring incident radiation comprising a substrate defining a cavity, a thermal detector unit disposed above the cavity, an antenna coupled to the substrate, and a plurality of conductors in contact with the antenna and the thermal detector unit, the improvement comprising:

each of the plurality of ~~the~~ conductors defining a multi-layer structure and comprising:

a support layer adjacent to the substrate;

a superconductive layer opposite the substrate; and

a buffer layer between the support layer and the superconductive layer;

wherein each of said support layers cooperate to suspend the thermal detector unit over the cavity.

10.(Currently Amended) A method for making a radiation sensor comprising:

defining a cavity within a substrate;

depositing a filler material within the cavity;

depositing a thermal detector unit onto the filler material;

depositing an antenna onto the substrate;

depositing a plurality of multi-layer conductive leads to contact the thermal detector unit and the antenna, wherein each of the plurality of ~~the~~ multi-layer conductive leads defines a layer of superconductive material, a support layer, and a buffer layer therebetween; ~~and~~

conductively bonding a first segment of the conductive lead to the antenna to form an electrically conductive pathway between the superconductive material and the antenna, and a

second segment of the conductive lead to the thermal detector unit so as to form an electrically conductive pathway between the superconductive layer and the thermal detector unit; and

removing the filler material such that the support layers suspend the thermal detector unit over the cavity.

11.(Canceled)

12.(Original) The method of claim 10 wherein depositing a thermal detector unit comprises depositing a thermally reactive material over at least a portion of the filler material and delineating edges thereof to define the thermal detector unit.

13.(Currently Amended) The method of claim 10 wherein depositing an antenna onto the substrate comprises depositing a conductive material onto the substrate and delineating edges thereof to define the antenna.

14.(Currently Amended) The method of claim 10 wherein depositing a plurality of multi-layer conductive leads comprises;

depositing a layer of support material to contact the thermal detector unit and the antenna;

depositing a layer of buffer material over at least a portion of the support material;

depositing a layer of superconductive material over at least a portion of the buffer material; and

delineating ~~at least one~~ the plurality of conductive leads by removing at least one of excess support material, excess buffer material, and excess superconductive material.

15.(Original) The method of claim 14 wherein depositing a layer of buffer material includes laser depositing with ion beam assist.

16.(Currently Amended) The method of claim 10 for making an array of radiation sensors, wherein

defining a cavity within a substrate comprises defining a plurality of cavities within a substrate;

depositing a filler material within the cavity comprises depositing filler material within the plurality of cavities;

depositing a thermal detector unit onto the filler material comprises depositing at least one thermal detector unit onto the filler material within each cavity;

depositing an antenna onto the substrate comprises depositing at least one antenna onto the substrate for each said cavity;

depositing a plurality of multi-layer conductive leads to contact the thermal detector unit and the antenna comprises, for each ~~depositing a plurality of conductive leads, each conductive lead contacting one~~ thermal detector unit, suspending said thermal detector unit over one cavity with a plurality of the conductive leads that couple the said thermal detector unit to ~~and~~ one antenna; and

conductively bonding comprises bonding a first and second segment of each conductive lead to one of an antenna and a thermal detector unit.